

**REMARKS**

The Official Action mailed March 27, 2008, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant notes with appreciation the consideration of the Information Disclosure Statement filed on June 23, 2006.

Claims 1-35 are pending in the present application, of which claims 1-5, 10 and 14 are independent. Claims 1-5 and 10 have been amended to better recite the features of the present invention. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

The Official Action rejects claim 1 as anticipated by U.S. Publication No. 2002/0070352 to Allan. The Applicant respectfully submits that an anticipation rejection cannot be maintained against the independent claims of the present application, as amended.

As stated in MPEP § 2131, to establish an anticipation rejection, each and every element as set forth in the claim must be described either expressly or inherently in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

Independent claim 1 already recites crystallization or activation for a semiconductor layer by irradiating the semiconductor layer with a laser beam, and in both techniques, components (atoms) in the semiconductor layer are aligned by the laser irradiation (i.e. crystallized or activated). Also, claim 1 has been amended to recite a method of manufacturing a semiconductor device which comprises a crystallized semiconductor layer, an insulating layer and a conductive layer. For the reasons provided below, the Applicant respectfully submits that Allan does not teach the above-referenced features of the present invention, either explicitly or inherently.

Allan appears to teach a three dimensional structure and that "a photonic crystal element" has been formed in a photo sensitive glass by laser irradiation. The "photonic crystal element" of Allan is different from the crystallized semiconductor layer as presently claimed, and the "photonic crystal element" of Allan does not anticipate the crystallized semiconductor layer of the present claims.

Also, Allan does not teach a semiconductor layer and crystallizing the semiconductor layer, either explicitly or inherently.

Therefore, the Applicant respectfully submits that Allan does not teach crystallization or activation for a semiconductor layer by irradiating the semiconductor layer with a laser beam, and in both techniques, components (atoms) in the semiconductor layer are aligned by the laser irradiation, and a method of manufacturing a semiconductor device which comprises a crystallized semiconductor layer, an insulating layer and a conductive layer, either explicitly or inherently.

Since Allan does not teach all the elements of the independent claims, either explicitly or inherently, an anticipation rejection cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 102 are in order and respectfully requested.

The Official Action rejects claims 2, 3 and 6-13 as obvious based on the combination of Allan and U.S. Publication No. 2006/0144828 to Fukumitsu. The Applicant respectfully submits that a *prima facie* case of obviousness cannot be maintained against the independent claims of the present application, as amended.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some reason, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the

prior art to produce the claimed invention where there is some reason to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims, as amended. Independent claims 2 and 3 already recite crystallization or activation for a semiconductor layer by irradiating the semiconductor layer with a laser beam, and in both techniques, components (atoms) in the semiconductor layer are aligned by the laser irradiation (i.e. crystallized or activated). Also, claims 2 and 3 have been amended to recite a method of manufacturing a semiconductor device which comprises a crystallized semiconductor layer, an insulating layer and a conductive layer. Further, independent claim 10 recites, among other features, a laser irradiation method comprising the steps of emitting a first laser which is a fundamental wave from a laser oscillator, processing the first laser beam into a second laser beam which is one of a linear shape and a rectangular shape on an irradiation surface, and irradiating an object with the second laser beam which generates a multiphoton absorption. For the reasons provided below, Allan and Fukumitsu, either alone or in combination, do not teach or suggest the above-referenced features of the present invention.

Please incorporate the arguments above with respect to the deficiencies in Allan. Fukumitsu does not cure the deficiencies in Allan. Fukumitsu appears to teach a processing laser for cutting an object 1 (Figures 1-6, 8-11 and 12). However, Allan and Fukumitsu, either alone or in combination, do not teach or suggest the above-referenced features of claims 1-3 and 10. Since Allan and Fukumitsu do not teach or

suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained.

Furthermore, there is no proper or sufficient reason, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Allan and Fukumitsu or to combine reference teachings to achieve the claimed invention. MPEP § 2142 states that the examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. It is respectfully submitted that the Official Action has failed to carry this burden. While the Official Action relies on various teachings of the cited prior art to disclose aspects of the claimed invention and asserts that these aspects could be used together, it is submitted that the Official Action does not adequately set forth why one of skill in the art would combine the references to achieve the features of the present invention.

The test for obviousness is not whether the references "could have been" combined or modified as asserted in the Official Action, but rather whether the references should have been. As noted in MPEP § 2143.01, "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art" (emphasis in original). KSR International Co. v. Teleflex Inc., 550 U.S. \_\_\_, \_\_\_, 82 USPQ2d 1385, 1396 (2007). Thus, it is respectfully submitted that the standard set forth in the Official Action is improper to support a finding of *prima facie* obviousness.

The Official Action concedes that "Allan et al is silent with respect to the recited limitations concerning the laser and the condenser and the power" (page 3, Paper No. 20080317). The Official Action relies on Fukumitsu to allegedly teach numerous features, including multiphon absorption, melting and change in crystal structure, movement of the laser beam or state, a pulse width in the femtosecond range, a fundamental wave of a NdYAG laser, the claimed power range, a condenser with cylindrical lenses and a linear beam shape (pages 3-4, *Id.*). Without any specific references to Allan or Fukumitsu in support and without statements which establish the

level of ordinary skill in the art at the time of the present invention, the Official Action asserts that "[i]t would have been obvious ... to have combined the apparatus and settings taught by Fukumitsu et al with the method taught by Allan et al in order to obtain the desired results in the case of silicon crystallization" (page 4, Id.). That is, the Official Action asserts that the processing or cutting method taught by Fukumitsu could be applied to Allan. The Applicant respectfully disagrees and traverses the above assertions in the Official Action.

Allan and Fukumitsu do not describe analogous art. Fukumitsu is directed to an entirely different field of endeavor from the present application and Allan. Specifically, Fukumitsu is directed to a processing laser for cutting an object 1 (Figures 1-6, 8-11 and 12), which is entirely irrelevant to Allan and the features of the present claims. The Applicant respectfully submits that the processing or cutting method of Fukunaga is not necessary for Allan's method for forming "the photonic crystal element" and is not necessary for achieving the features of the claimed invention, which are provided for crystallizing or activating a semiconductor. Consequently, Fukumitsu is not in the field of the Applicant's endeavor, is not reasonably pertinent to the particular problem with which the inventor is concerned, and would not have logically commended itself to an inventor's attention in considering the problem (see MPEP § 2141.01(a)). Therefore, the Applicant respectfully submits that the Official Action has not provided a proper or sufficient reason, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Allan and Fukumitsu or to combine reference teachings to achieve the claimed invention.

Also, the Supreme Court in KSR noted that the analysis supporting a rejection under 35 U.S.C. § 103 should be made explicit (KSR International Co. v. Teleflex Inc., 550 U.S. \_\_\_, 82 USPQ2d 1385). The Court quoting In re Kahn (441 F.3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006)) stated that "[R]ejections on obviousness cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of

obviousness.” KSR, 550 U.S. at \_\_\_, 82 USPQ2d at 1396. In the present application, the Official Action appears to contain mere conclusory statements, for example, at page 4 (Paper No. 20080317), and the Official Action has not set forth articulated reasoning with some rational underpinning to support the assertion of *prima facie* obviousness.

Therefore, the Applicant respectfully submits that the Official Action has not provided a proper or sufficient reason, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Allan and Fukumitsu or to combine reference teachings to achieve the claimed invention.

In the present application, it is respectfully submitted that the prior art of record, either alone or in combination, does not expressly or impliedly suggest the claimed invention and the Official Action has not presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

The Official Action rejects claims 14-35 as obvious based on the combination of Allan, Fukumitsu and U.S. Publication No. 2004/0087118 to Maegawa. The Applicant respectfully traverses the rejection because the Official Action has not made a *prima facie* case of obviousness.

Independent claim 14 recites a laser irradiation apparatus having a solid state laser oscillator for emitting a laser beam which is a fundamental wave, a condenser lens forming the laser beam which is the fundamental wave into one of a linear shape and an elliptical shape, and means for moving the irradiation surface relatively to the laser beam which is the fundamental wave.

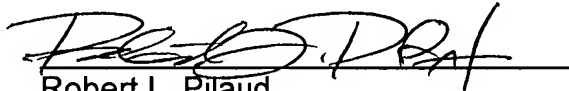
Please incorporate the arguments above with respect to the deficiencies in Allan and Fukumitsu. Maegawa does not cure the deficiencies in Allan and Fukumitsu. The Official Action relies on Maegawa to allegedly teach “the formation of a junction by

implantation and activation by phonon excitation in the substrate" (page 4, Paper No. 20080317). However, Allan, Fukumitsu and Maegawa, either alone or in combination, do not teach or suggest a laser irradiation apparatus having a solid state laser oscillator for emitting a laser beam which is a fundamental wave, a condenser lens forming the laser beam which is the fundamental wave into one of a linear shape and an elliptical shape, and means for moving the irradiation surface relatively to the laser beam which is the fundamental wave. Since Allan, Fukumitsu and Maegawa do not teach or suggest all the claim limitations and since there is insufficient reason to combine Allan, Fukumitsu and Maegawa, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Finally, the Official Action mailed March 27, 2008, appears to be incomplete. The Official Action is silent as to independent claims 4 and 5. As such, the Applicant respectfully requests issuance of a Notice of Allowability or new non-final Official Action, as appropriate. Claim 4 has been amended in a manner similar to claims 1-3. The clarifications of claim 5 are supported in the present specification, for example, by Figure 7 and Embodiment Mode 3, beginning at page 21, line 25. For at least the reasons set forth above, the Applicant respectfully submits that claims 4 and 5 are in condition for allowance.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'R. L. Pilaud', written over a horizontal line.

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